REMARKS

Reconsideration and allowance of the subject application in view of the foregoing amendments and the following remarks is respectfully requested. Entry of the Amendment under Rule 116 is merited as it raises no new issues and requires no further search.

By this Amendment, claims 1 and 12 are amended. Applicants respectfully submit, however, that the claims are not narrowed by such an amendment since such amendment only makes explicit that which was implicitly recited in the original claims.

A. Claims 1-5, 7 and 23 stand rejected under 35 USC 103(a) over *Cooper* (US Pub 20020044531) in view of *Kawai et al.* (US 20030036361). This rejection is respectfully traversed for the following reasons:

- first, the disclosures of *Cooper* and *Kawai*, taken as a whole, do not suggest Applicants' claimed method of measuring transmission quality of multimedia data;
- second, the asserted combination of references does not teach or suggest all of Applicants' claim features; and
- third, the grounds of rejection constitute an improper reconstruction of Applicants' claimed invention.

As amended, independent claim 1 recites:

> A method of measuring transmission quality of multimedia data, comprising the steps of:
>
> (a) a transmitter transmitting multimedia data through a channel to a receiver in such a way that the transmitter can estimate the multimedia data played at the receiver using information on errors occurring during the multimedia data transmission;
>
> (b) the receiver receiving the multimedia data from the transmitter and transmitting, to the transmitter through a return channel, information on errors occurring during the multimedia data transmission;
>
> (c) estimating, at the transmitter, the multimedia data played at the receiver using the error information received from the receiver, and
>
> (d) measuring, at the transmitter, the transmission quality of the multimedia data received by the receiver by comparing the estimated received data with reference data.
>
> (Emphasis added).

The Examiner alleges that paragraph [0016] and Fig. 3 of *Cooper* discloses step (a) of claim 1, and relies on *Kawai* to disclose steps (b)-(d). Applicants respectfully disagree and submit that claim 1 is patentable over the alleged combination of *Cooper* and *Kawai* for the failure of the applied art to not only disclose, teach or suggest all of Applicants' recited claim features, but in addition fails to present any apparent reason to combine references or modify prior art to create the Applicants' allegedly obvious claim elements.

Regarding step (a), Applicants respectfully submit that *Cooper* appears to only disclose, at paragraph [0016], wherein:

> a method includes constructing a data pattern for generating a reference signal to measure a specific channel characteristic, inserting the data pattern in an Internet Control Message Protocol echo request, transmitting an Internet Control Message Protocol echo request from a primary station across a shared physical medium to a secondary station, receiving the echo request at the secondary station, transmitting an Internet Control Message Protocol echo reply in response to the echo request across the shared physical medium to the primary station, receiving the echo reply at the primary station, measuring a bit slicer error of the Internet Control Message Protocol echo reply, and characterizing the channel quality of the communications channel as a function of the bit slicer error. (Emphasis added).

Furthermore, in paragraph [0015] *Cooper* states that:

> The Internet Control Message Protocol (ICMP) provides a mechanism within the Internet Protocol (IP) for characterizing a channel. Using the transmitters and receivers that constitute a portion of the Internet Protocol based devices in an Internet Protocol network, an Internet Control Message Protocol echo request may be constructed that contains a reference message to be repeated back to the sender. The reference message has a length and content selected for measuring the channel quality. Several reference messages may be constructed having different lengths and contents for generating a channel characteristic for a variety of signals on a shared medium, and each of the reference messages may be identified by a corresponding Internet Control Message Protocol header identifier and sequence number. The Internet Control Message Protocol echo request is transmitted from a selected first node in the Internet Protocol network, received at a selected second node in the Internet Protocol network, and re-transmitted from the second node back to the first node as an Internet Control Message Protocol echo reply. (Emphasis added).

Applicants respectfully submit that nowhere does *Cooper* disclose, teach, or suggest wherein the ICMP message is intended to send multimedia data that the receiver is supposed to play for a user. Furthermore, as underlined above, *Cooper's* reference message transmitted by the transmitter is the same message that is repeated back to the transmitter from the receiver.

Applicants, on the other hand, recite wherein the receiver transmits "information on errors occurring during the multimedia data transmission" back to the transmitter and not the same message transmitted by the transmitter.

Accordingly, Applicants respectfully submit that *Cooper* at least fails to render obvious at least step (a) of claim 1.

The Office Action further asserts that *Kawai* makes up for the deficiencies of *Cooper* in regards to steps b-d, alleging that it would be obvious to one of ordinary skill in the art "to modify the method of *Cooper* to include a receiver receiving the multimedia data from the transmitter as taught by *Kawai* in order to provide a receiver for receiving the broadcast applying signal from the broadcasting control center, thereby controlling the broadcasting time of the detected multimedia Data that's developed high quality service for customer[sic]."

Applicants respectfully disagree and submit that *Kawai* appears to only relate to a burst signal transmission in a mobile communications system. Notwithstanding any disclosure of *Kawai* with regards to measuring the state of a radio channel, the combination of a burst transmission method on a radio channel, as disclosed by *Kawai* with the IP method of *Cooper*, is improper, and appears to be based on hindsight reasoning.

Applicants respectfully submit that *Kawai* mainly teaches how to determine a transmission power value and/or a transmission rate in accordance with a state of the radio channel to transmit a burst signal. The required transmission power estimating unit **105** and the channel state measuring unit **104** have nothing to do with estimating the multimedia data played at the receiver. In fact, "the required transmission power estimating unit **105** calculates the transmission power value such that signal reception can be made with **a predetermined quality** in the receiving device 200" (paragraph 103). *Kawai* even allows some errors at the received even though the transmitter may not know the effects of the errors as long as the errors are within the predetermined quality. *Kawai* is not concerned with estimating the multimedia data played at the receiver and measuring the transmission quality of the multimedia data. A key idea of the present invention is to estimate the multimedia data played at the receiver and evaluate the quality of the multimedia data played at the receiver. On the other hand, *Kawai* does not disclose any of these ideas.

Indeed, these two technologies and methodologies are incompatible with each other and combining these two technologies does not make it possible to estimate the multimedia data played at the receiver and measure the transmission quality of the multimedia data played at the receiver by the transmitter. Accordingly, Applicants respectfully submit that not only do neither *Cooper* nor *Kawai* suggest the desirability of combining such teachings, but in addition, one of ordinary skill in the art would not be motivated to combine teachings of burst transmission in mobile communications, as disclosed by *Kawai*, with modification of the ICMP request and echo reply mechanism the IP, as disclosed by *Cooper*. It is improper to use the claimed invention as an instruction manual to piece together the teachings of the prior art so that the claimed invention is rendered obvious. The Office Action appears to use improper hindsight reconstruction to pick and choose among isolated disclosures. Accordingly, it is respectfully submitted that the combination is improper.

Thus, Applicants respectfully submits that independent claim 1 is patentable over the alleged combination of *Cooper* and *Kawai* based upon the failure of the alleged combination of references to disclose, teach, or suggest each and every feature of claim 1, as well as for the impermissible combination of *Cooper* and *Kawai*. Claims 2-5 and 7 are likewise patentable at least based on their dependency on an allowable base claim, as well as for additional features they recite.

Claim 2, for example, recites wherein the error information is transmitted to the transmitter through the return channel "only when a transmission error of the multimedia data is detected." Applicants respectfully submit that the method of *Kawai* requires the receiver to respond with radio channel status information in order for the transmitter to transit the burst transmission. Accordingly, claim 2 is patentable not only based upon its dependency on an allowable claim but further because the failure of the applied references to teach at least the added feature of claim 2.

Regarding claim 3, in *Cooper*, Applicants respectively submit that no error concealment technique is used. An error concealment technique is applied at the final decoder just before the video is played to the user and is not applied at internet nodes.

Regarding claim 4, an error concealment technique is used to improve perceptual quality of impaired areas. For example, broken blocks or green blocks in a picture due to transmission

errors are replaced using the blocks at the same positions of the previous picture. Applicants respectively submit that *Kawai* does not employ any error concealment technique.

Regarding claim 5, Applicants respectively submit that the required transmission power estimating unit **105** of *Kawai* calculates the transmission power value such that signal reception can be made with a predetermined quality in the receiving device 200 and does not estimate the multimedia data played at the receiver.

Regarding claim 7, Applicants respectively submit that *Kawai* never estimates the multimedia data played at the receiver and measure the transmission quality of the multimedia data at the receiver as perceived by a user.

Regarding the rejection of independent claim 23, Applicants respectfully submit that as presented above, the combination of *Cooper* and *Kawai* is improper, the Office Action appearing to use improper hindsight reconstruction to pick and choose among isolated disclosures. Furthermore, Applicants respectively submit that *Kawai* does not extract and transmit a set of parameters from a video segment which are affected by errors occurring during multimedia data transmission. The channel state measuring unit **104** does not measure the transmission quality of the multimedia data at the receiver as perceived by a user.

Accordingly, withdrawal of the rejection of claims 1-5, 7 and 23 over the alleged combination of *Cooper* and *Kawai* is respectfully requested.

B. Claims 6, 8, 9-22 and 24 stand rejected under 35 USC 103(a) over *Cooper* in view of *Kawai*, and further in view of one or more of *Saunders et al.* (US 6,351,733) and *Caviedes et al.* (US 2002/0002709). Applicants respectfully traverse this rejection.

Applicants submit that *Saunders* appears to only relate to enhancement of a desired portion of the audio signal for individual listeners (*see* column 1, lines 15-17) and fails to remedy the deficiencies of *Cooper* and *Kawai*, as regarding claim 1.

Regarding claim 9, Applicants respectively submit that *Cooper* and *Kawai* fail to teach to estimate the transmission quality of the multimedia data at the receiver using one of a full-reference, a reduced-reference, and a no-reference method, which are methods to measure the multimedia quality.

Independent claim 12 is amended similarly to claim 1, and further recites "an estimation unit estimating the received data received at the receiver using the returned error information." Accordingly, Applicants submit that claim 12 is likewise allowable over the alleged combination of the applied references.

Claims 6, 8, 9-22 and 24 depend variously from independent claims 1 and 12, and as presented above, are likewise patentable over *Cooper, Kawai*, and *Saunders*. Withdrawal of the rejection is respectfully requested.

Claim 13 recites wherein the error information is transmitted to the transmitter through the return channel "only when an error occurs in the channel." Applicants respectfully submit that in the method of *Cooper*, the receiver does not transmit "information on errors occurring during the multimedia data transmission" back to the transmitter. Furthermore, in *Cooper*, the receiver **always** returns the ICMP echo reply, which includes a reference signal, no matter whether there is a transmission error or not.

Regarding claim 14, in *Kawai*, Applicants respectively submit that no error concealment technique is used. In particular, the error concealment technique, which is used to improve perceptual quality of impaired areas in video signals, has nothing to do with a transmission power value and/or a transmission rate in accordance with a state of the radio channel to transmit a burst signal.

Regarding claim 15, since *Kawai* does not employ any error concealment technique, Applicants respectively submit that no information on error concealment technique is sent to the transmitter in *Kawai*.

Regarding claim 16, Applicants respectively submit that *Kawai* does not estimate the multimedia data played at the receiver by the transmitter.

Claim 17 depends on claim 16 with further limitations.

Regarding claim 18, Applicants respectively submit that *Kawai* never needs the reference data to measure the transmission quality of the multimedia data played at the receiver since the methods in *Kawai* do not measure the transmission quality of the multimedia data.

Regarding claim 19, Applicants respectively submit that *Cooper* and *Kawai* fail to teach to estimate the transmission quality of the multimedia data at the receiver using one of a full-

reference, a reduced-reference, and a no-reference method, which are methods to measure the multimedia quality.

Regarding claim 21, for example, Applicants submit that *Caviedes*, at paragraph [0002], appears to only relate to "a method and system for estimating the quality of pictures without referring to the source video data" (emphasis added). Because *Caviedes* does not base its quality analysis on the originally transmitted data, *Caviedes* has no need to, and indeed fails to disclose transmission of any error information back to the transmitter.

Regarding claim 24, Applicants respectively submit that *Saunders* does not extract and transmit a set of parameters from a video segment which are affected by errors occurring during multimedia data transmission.

Conclusion

All objections and rejections having been addressed, it is respectfully submitted that the present application should be in condition for allowance and a Notice to that effect is earnestly solicited. Early issuance of a Notice of Allowance is courteously solicited.

Entry of the amendments is proper under 37 CFR §1.116 since the amendments: (a) place the application in condition for allowance (for the reasons discussed herein); (b) do not raise any new issue requiring further search and/or consideration (since the amendments amplify issues previously discussed throughout prosecution); and (c) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to arguments raised in the final rejection. Entry of the amendments is thus respectfully requested.

The Examiner is invited to telephone the undersigned, Applicants' attorney of record, to facilitate advancement of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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